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AUTHOR Hansell, Stephen

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ABSTRACT

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EGO DEVELOPMENT AND SOCIAL NETWORK STRUCTURE

Grant No. NIE-G-78-0210

Stephen Hansell

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Introductory Statement

The Center for Social Organization of Schools has two primary objectives: to develop a scientific knowledge of how schools affect their students, and to use this knowledge to develop better school practices and organization.

The Center works through four programs to achieve its objectives. The Policy Studies in School Desegregation program applies the basic theories of social organization of schools to study the internal conditions of desegregated schools, the feasibility of alternative desegregation policies, and the interrelation of school desegregation with other equity issues such as housing and job desegregation. The School Organization program is currently concerned with authority-control structures, task structures, reward systems, and peer group processes in schools. It has produced a large-scale study of the effects of open schools, has developed Student Team Learning Instructional processes for teaching various subjects in elementary and secondary schools, and has produced a computerized system for school-wide attendance monitoring. The School Process and Career Development program is studying transitions from high school to post secondary institutions and the role of schooling in the development of career plans and the actualization of labor market outcomes. The Studies in Delinquency and School Environments program is examining the interaction of school environments, school experiences, and individual characteristics in relation to in-school and later-life delinquency.

This report, prepared by the School Organization program, is part of the program's examination of peer group processes in schools.

Abstract

This research investigated the relationship between ego development and social network structure in grades 9 through 12 in a private school. Students filled out a sentence completion test for ego development and named friends with whom they spent the most time in school on a sociometric questionnaire. Popularity, mutuality in dyads, and choices among friends in triads were expected to be high at middle range ego levels and low at the higher and lower ego levels. Choices between cliques were expected to be low at middle range ego levels but high at the higher and lower ego levels. Results supported the hypotheses for girls only, suggesting a sex difference in the importance of network structures for personality development. Girls at the highest stages of ego development also had unique roles as liaisons between cliques, while having fewer mutual friendships in dyads. These results challenge the assumption that increased interpersonal mutuality always accompanies personality growth and suggest that, under certain circumstances, imbalance in dyads facilitates the integration of larger network structures.

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Introduction

It has been widely asserted that personality development is a function of the structure of the surrounding social environment. Many developmental theories argue that personality growth is stimulated by participation in progressively more complex and differentiated environments. For example, Piaget's (1950) theory of cognitive development leads to the hypothesis that experience in task-oriented, performance-contingent relationships with teachers and students in school would challenge cognitive capabilities developed in diffuse, intimate family relationships. Children's attempts to cope with new social situations are expected to result in more advanced cognitive capabilities. Although recent work has begun to illuminate the development of social behavior (Glick and Clarke-Stewart, 1978) no study has yet included the systematic measures of social structure needed to explore the relationship between personality and social structure in detail.

The sociological literature on social networks also provides little evidence about the association between personality development and network structure, although a few studies have documented age trends in social roles. Gronelund (1959) and Glidwell, Kantor, Smith and Stringer (1966), for example, reported that older students in school settings tended to have more mutual, reciprocated friendships than younger students; however, a more recent study by Epstein (Note 1) failed to find any relationship between age and mutuality in dyads. Leinhardt (1972) extended research on the structure of children's friendships to three-person groups. In a study of students in kindergarten through sixth grade, he found significantly greater transitivity among older students.

These studies are difficult to interpret because they use age as the developmental criterion. At best, age is an indirect measure of development, because children mature at different rates. It is impossible to know whether an "age effect" is due to personality development or to a host of external influences on behavior. Leinhardt (1972) noted this problem in his discussion of the substantial variation of transitivity in friendship triads within age groups. Taken together, these studies indicate that more developed (i.e., older) students participate in more complex social structures, but reliance on age as the independent variable may have obscured important aspects of the association between personality and social structure.

A second limitation of existing research is its exclusive focus on social structure in small social units, usually dyads or triads. With the exception of Hallinan's (1979) study of classroom structure, which found that older students formed more and larger cliques, no studies have examined developmental trends in large social structures. Although the structure of dyads and triads has important implications for network-wide social processes (Holland and Leinhardt, 1977), large social structures probably have some consequences independent of these small social units (e.g., Laumann and Pappi, 1976; Alba and Moore, 1978). Liaison relationships between cliques, for example, have unique potential for integrating entire social networks (Granovetter, 1973) and are likely to require special interpersonal skills that are related to personality development.

Recent methodological developments in personality and social network analysis enable a more precise investigation of the association between personality and social network structure. This study describes the

relationship between individuals' ego development (Loevinger, 1976; Loevinger and Wessler, 1970) and their positions in the relatively closed social network of a high school. The study also examines individual involvements in large-scale clique structrues as well as dyads and triads.

Ego Development and Social Network Structure

According to Loevinger (1976), the ego is the organizing process within the personality, the world view or guiding framework which structures the perception and assimilation of experience. She and her associates have identified six successively more differentiated and complex stages of ego development: the Impulsive, Self-Protective, Conformist, Conscientious, Autonomous and Integrated stages. Each stage is characterized by a combination of cognitive complexity, moral development, conscious preoccupations and interpersonal style.

For the present research the most important aspect of Loevinger's theory of ego development is the interpersonal dimension. Clear hypotheses about the social structures best suited to persons at each ego level can be derived from the theory. She has described individuals at the lowest, Impulsive and Self-Protective, ego levels as having egocentric orientations in interpersonal relations. Impulsives are thought to see others mainly as potential sources of supply and Self-Protective individuals defend against overwhelming feelings of vulnerability by exploiting others. Based on her theory, low ego level persons would be expected to have self-serving, unbalanced relationships rather than fully mutual relationships. They would lack both the decoding skills needed to understand others' points of view and the behavioral skills required to encode effective, mutually rewarding responses. Alternately dependent and exploitative, low

ego level individuals would have difficulty maintaining permanent relationships. They would have a series of relatively transient, unreciprocated social involvements which provide immediate gratification.

At the middle range of ego development, the theory states that people at the Conformist and Conformist/Conscientious ego levels are concerned with belonging to the right clique, having status with peers, and maintaining social appearances. Being friendly and pleasant is probably highly stressed because popularity and social acceptance may depend on these traits. Conformists have made the developmental transition to mutually beneficial social relationships, but at a relatively superficial level. Mutuality at the Conformist level probably depends on tangible exchanges of social support. Moreover, these relationships probably require frequent reaffirmation. Because of the heavy allocations of time and energy associated with continual expressions of group loyalty, their relationships are easily threatened by competing social involvements. Based on the theory, Conformists have developed strong social needs and are expected to surround themselves with the social support of many balanced, mutual friendships. They are also expected to prefer transitive cliques in which their friends are friends with each other.

At higher ego stages, Conscientious and Autonomous, a growing awareness of others as fully functioning individuals with their own unique sets of needs is anticipated. An increased ability to understand and respond to others' motivations as well as their overt behaviors probably produces relationships of greater intimacy and dimensionality. Paradoxically, high ego level individuals are expected to de-emphasize the need for mutuality typical of Conformists and can probably better tolerate temporary lapses

in friends' allegiances. Based on the theory, they are expected to maintain relationships in which one participant is more committed than the other, but which still benefit both. Furthermore, they are expected to prefer the diversity and stimulation of friends with a variety of interests who are members of different cliques and do not associate with each other. Also, while both high and low ego level persons are expected to have more unreciprocated relationships than Conformist or Conformist/Conscientious individuals, high ego level persons are believed capable of giving as well as receiving support. Their potential for enjoying altruistic relationships probably gives them special capability as liaisons between cliques, and under certain conditions they may be disproportionately influential in integrating large social networks.

Method

Subjects

The 254 students in grades nine through twelve in a private school, here called Lakeside, participated in this study. Lakeside was chosen because the school's organizational characteristics maximized the chances of finding a relationship between ego development and social structure. Lakeside is characterized by high levels of face-to-face interaction. Because of its small size it is what Barker and Gump (1964) called an "undermanned" school. There is continual pressure for students to become involved in more school activities and, as a consequence, increase their social interaction. There are also few institutional constraints on student choices of friends. Students meet in mixed grade-level classes and in many regularly scheduled schoolwide activities. Also, the student body is relatively homogeneous. There is no tracking system; everyone takes

college preparatory courses and all Lakeside graduates go to college. Compared with students in most schools, students in Lakeside are extraordinarily free to experiment with varying types of friendship structures. Lakeside meets Newcomb's (1978) criteria for a situation in which interpersonal balance is expected to correspond to internal, psychological balance. By extending Newcomb's logic, student involvements in larger social structures are expected to reflect personality preferences in the context of Lakeside school.

The Measurement of Ego Development

Of the 254 students, 87% completed a sentence completion test, which was scored for ego development using Loevinger's criteria. To avoid gender-specific content this research used a shortened sentence completion test of 12 items selected from Loevinger and Wessler's (1970) original 36 items. Loevinger and Wessler reported values of Cronbach's alpha as high as .92 for the full 36-item sentence completion test, indicating excellent item consistency. The alpha computed from the reduced sample of 12 items used in this study was .69, still very adequate for a projective personality test. A second scorer, blind to both the hypotheses and students' identities, rated 25 protocols chosen to represent grade and sex groups. The correlation between raters' total protocol ratings was .91 ($n = 25$, $p < .01$), indicating excellent interscorer reliability. In his review of ego development studies, Hauser (1976) reported that the sentence completion test has excellent test-retest reliability.

In analyses where ego development was used as the dependent variable, the Impulsive ego level was coded as 1, the Self-Protective level as 2, the Self-Protective/Conformist transition as 3, the Conformist level as 4,

the Conformist/Conscientious transition as 5, the Conscientious level as 6, the Conscientious/Autonomous transition as 7, and the Autonomous level as 8. The mean ego score for the entire sample was 5.33, with a standard deviation of 1.47. Scores for both boys and girls ranged from 1 to 8.

To test the effects of ego development on network structure the sample was trichotemized into low, medium and high ego level groups. Students at the Impulsive, Self-Protective and Self-Protective/Conformist ego levels were classified as low. The medium group consisted of students at the Conformist/Conscientious level because that is the modal ego score reported in a wide variety of studies (Loevinger, 1976). Students at the Conscientious, Conscientious/Autonomous and Autonomous levels were in the high ego level group. The handful of students at the Conformist level, three boys and five girls, were included in the low ego level group to raise the n in that category. This had the effect of making tests for the predicted quadratic trends more conservative.

The Sociometric Measurement of Friendship Choices

Several researchers have argued that the amount of time individuals spend together indicates the strength of their friendships, as long as they are free to control their contacts (Homans, 1974; Insko and Wilson, 1977; Moreno, Jennings and Sargent, 1940). Therefore, students in Lakeside were asked, "Who are your closest friends here in school, that is, who do you actually spend the most time with here in school?" Questionnaire space was provided for three names, although students were not limited to a fixed number of choices. Some students mentioned up to eight friends. This variant of the fixed choice procedure underestimates the absolute extent of friendships in the student network (Holland and Leinhardt, 1973;

Hallinan,(1974), but there were no differences in the number of choices made, by sex, grade or ego levels. Because the hypotheses deal with comparisons among ego levels, this sociometric methodology was judged adequate and efficient.

Individual popularity. The mean number of choices received by students was 3.29, with a standard deviation of 2.01 and a range of 0 to 10. A few students received 8, 9 or 10 choices, but there were no overwhelming sociometric "stars" and the distribution was relatively unskewed. The number of friendship choices each student received was used as an index of popularity. One general hypothesis can now be stated in terms of this measure of social structure. Conformist/Conscientious students are expected to have more friends than low or high ego level students. Therefore, popularity is expected to have an inverted U-shaped distribution across ego development.

Mutuality in dyads. Heider's (1958) balance principle can be used to describe dyadic interpersonal relationships. If person A likes person B and B also likes A, the relationship is balanced and based on mutual choices. If B, however, does not reciprocate A's liking, an unbalanced relationship exists. My hypothesis is that individuals at the Conformist/Conscientious ego level will have the highest number of reciprocated, mutual-choice friendships, controlling for the total number of choices made. The preference for mutuality in dyads is expected to have an inverted U-shaped distribution across ego development.

Choices among one's friends in triads. The strategy adopted to examine network structure in triads is a compromise between exploiting all of the information in the sociometric

choices and avoiding the ambiguous meaning of nonchoices, which may represent disliked persons, individuals who would have been named if more questionnaire space had been provided, or persons simply unknown to the chooser. For each student, the first three persons named as friends were identified. Then choices among these three friends were examined and counted. If none of these friends named each other, the focal student was assigned a minimum score of zero. If all of his or her friends named each other as friends, the focal student got a maximum score of six. While this score is insensitive to the direction or mutuality of choices among one's friends, it represents the overall density of choices among them. My hypothesis is that Conformist/Conscientious students, given their high needs for social support, will have friends who in turn choose each other more than the friends of students at lower or higher ego levels. An inverted U-shaped distribution of choices among one's friends is expected across ego development levels.

Choices between cliques. The first step in examining between-clique choices is the identification of friendship cliques. Unfortunately, no unambiguous method exists for identifying cliques for a sociomatrix this large. Each clustering algorithm has advantages and disadvantages which tend to be specific to the sociomatrix under examination. No single technique yields the best solution for every sociomatrix, and it is impossible to anticipate the best method beforehand (Lankford, 1974). A second problem in larger sociomatrices is the increased difficulty of assigning each person to a single clique, because of more interconnections between cliques. Clique boundaries in a large sociomatrix are often less distinct, reflecting the realities of overlapping group affiliations.

Because the particular problems presented by this sociomatrix were not well handled by any single method, existing techniques were modified and combined and the following exploratory method was used. The path distance (Harary, Norman and Cartwright, 1965) between each pair of persons was calculated. Path distance is the minimum number of choices that must occur to connect two people in a sociomatrix. In Lakeside, 185 of the 254 students were mutually reachable in a finite number of paths, although the path distance between a few pairs was as great as 17. Clearly, the limited choice format of the sociometric questionnaire increased the average path distance because many direct or short paths went unrecorded. For the present purpose, however, only relative differences in path distances are important. If it can be accepted that closer friends generally reached each other in smaller path distances than more casual friends, then it is a useful measure of social distance. The calculation of path distances obviously adds no new information to the original sociomatrix, but it does transform it into a more useable form.

The next step concerned missing data. Of the 254 students, 16% did not complete the sociometric questionnaire. They have all-zero rows in the original sociomatrix and rows of infinite path distances in the path distance matrix. Because it was important to assign everyone to a clique, subsequent calculations were based on columns of the path distance matrix, representing choices received by each student. Thus each student's clique assignment was based on the collective perceptions of 213 fellow students, greatly reducing the biasing potential of a few mistaken choices. However, 5% of the students, those who made unreciprocated choices only, were incorrectly classified as "isolates." Fortunately, the number of such students was not great.

After the 41 rows of missing choices were eliminated from the path distance matrix, the remaining infinite path distances represented pairs of students who were mutually unreachable in the network. These cells in the path distance matrix were assigned a path distance of 18, which was one more than the matrix diameter, or maximum observed path distance. A logarithmic transformation [ln(x+1)] was applied to the path distances to reduce the skewness in their distribution. Then each column in the transformed path distance matrix was correlated with every other column. These correlations indicate the similarity of each student pair's profile of choices-received and were used as measures of social proximity.

The correlations were entered into Johnson's (1967) hierarchical cluster analysis which identified the clique structure. In the "maximum method" of clustering, the 32,131 pairwise correlations were searched for the highest value. In this case, the largest correlation was a perfect 1.0 between a student pair with identical profiles of choices-received. They were, of course, mutual choice friends and were assigned to the same cluster. Then the program searched for the next highest correlation between individuals. If it belonged to a different pair, they started a new cluster. If the next highest correlation was between someone in the first cluster and a third person, he or she joined the already existing cluster. The program repeated this cycle, gradually adding individuals and subclusters to more general clusters until all 254 students were contained in a single gigantic cluster. The advantage of this method is that clusters were based only on the rank order of the correlations. Therefore, the clustering was relatively unaffected by outlying correlations. This method minimizes the values of clusters at each stage and yields relatively compact clusters with high intra-cluster similarity.

Because this cluster analysis has 253 steps, and therefore 253 possible solutions, finding the optimum clustering was a trade-off between clique discriminability and size. The smaller and more numerous the cliques, the greater their distinctiveness, but the high number of friendship choices between them obscures the structure of these connections. At the other extreme, it is easy to trace connections between a few large cliques, but more difficult to understand them in terms of clique characteristics. The optimum clustering would simultaneously maximize clique discriminability and size. A cluster value of .55 was chosen here as a compromise, and yielded 28 cliques with a median size of 8.5 students. Tests of alternative cluster solutions did not substantially affect the results, as long as extremely large or small clique sizes were avoided. Fully 71% of the 793 friendship choices occurred within cliques, which supports the reasonableness of this cluster solution.

Results

Girls scores significantly higher on ego development than boys, as shown in Table 1, $F(1,207) = 13.0$, $p < .01$. Also, there was a significant increase in ego development with grade level, $F(3,207) = 3.1$, $p < .03$. This effect was due to the lower ego levels of freshmen boys. Girls' ego scores were not significantly different across grade levels, and sophomore, junior and senior boys showed no significant differences in ego development. Subsequent analyses were performed separately by sex, and differences between freshmen and upper-grade boys were examined. In addition, grade level was used as a covariate to rule out age differences in network structure.

Insert Table 1 About Here

Popularity

Results supported the hypothesis, but only for girls. There was a significant relationship between girls' ego development and their popularity, controlling for grade level, $F(2,112) = 7.9$, $p < .01$. A partitioning of the main effect yielded the predicted quadratic trend, $F(1,112) = 14.0$, $p < .01$. The means in Table 2 demonstrate that Conformist/Conscientious girls received more friendship choices than either their lower or higher ego level counterparts. There were no grade or sex differences in popularity. The failure of the hypothesis for boys was unanticipated and established a pattern which was repeated across all measures of social structure.

Insert Table 2 About Here

Mutuality in Dyads

The number of choices students made influenced their opportunities to form mutual friendships and was therefore used as a covariate along with grade level. There was a significant relationship between the number of mutual choices and ego developments, controlling for choices made and grade, but again only for girls, $F(2,108) = 3.7$, $p < .03$. The predicted quadratic trend was significant, $F(1,108) = 7.5$, $p < .01$. The means in Table 3 show that Conformist/Conscientious girls had more mutual choices than lower or higher ego level girls. Again, the failure of the hypothesis for boys was unexpected. There were no grade differences in mutual choices but there was a significant sex difference. Girls averaged 2.31 mutual choices

and boys averaged 1.97, a difference which was significant, t (197) = 9.9, $p < .01$.

Insert Table 3 About Here

Choices among One's Friends in Triads

Of the 254 high school students, 16% did not complete the sociometric questionnaire, another 13% named fewer than three friends, and 9% named friends who did not name three friends. The hypothesis of a curvilinear relationship between ego development and choices among one's friends was tested on the remaining 62% (158) of the students. There was no need to control for choices made because choices between the first three friends only were examined for everybody. Controlling for grade, only girls exhibited the expected ego effect, $F(2,81) = 3.9$, $p < .03$. For girls, the quadratic trend shown by the means in Table 4 was significant, $F(1,81) = 5.3$, $p < .03$. The friends of Conformist/Conscientious girls chose each other as friends more often than the friends of girls at lower and higher ego levels. There were no sex differences in choices between one's friends, but girls in higher grades showed a significant decrease in these choices, $F(3,86) = 2.9$, $p < .05$.

Insert Table 4 About Here

Characteristics of Cliques

A discriminant function analysis uncovered the variables which maximally discriminated between cliques. Of 16 variables representing student background, demographic and performance characteristics, only two had loadings greater than .15 on the discriminant functions, grade (.96)

and sex (-.95). Grade and sex distinctions have long been the primary selection variables in schools (Coleman, 1961; Glidewell, et al., 1966; Gronelund, 1959). The fact that they were major discriminating variables in this study supports the credibility of the analysis.

There were 12 cliques consisting of at least 75% girls and 11 cliques with at least 75% boys. There were 5 cliques with members of both sexes in more even proportions. Of the mixed-sex cliques, 4 consisted of juniors or seniors and the remaining clique was a sophomore boy-girl dyad. There were no significant differences in mean sizes of boys' cliques, $\underline{M}$ = 7.00, girls' cliques, $\underline{M}$ = 9.58, and mixed-sex cliques, $\underline{M}$ = 9.20. The 28 cliques were distributed fairly evenly across grade levels, and mean clique sizes for freshmen and sophomores combined, $\underline{M}$ = 8.77, and juniors and seniors combined, $\underline{M}$ = 8.21, were not significantly different.

The hypothesis that students at the Conformist/Conscientious stage of ego development would prefer larger cliques than students at lower or higher ego levels was not supported. Seven cliques with mean ego scores less than 4.50 were classified as low in ego development, 15 cliques with mean ego scores between 4.50 and 5.49 were classified as medium in ego development, and 6 cliques with mean ego scores greater than or equal to 5.50 were classified as high ego level cliques. Although medium ego level cliques, $\underline{M}$ = 9.38, were slightly larger than low ego level cliques, $\underline{M}$ = 7.71, or high ego level cliques, $\underline{M}$ = 7.33, these differences were not significant. There were no size differences among girls' cliques across ego levels when examined separately.

Choices Made between Cliques

As predicted, there was a significant ego development effect on

choices made between cliques, controlling for grade and total choices made. However, the effect again occurred for girls only, $F(2,106) = 3.7$, $p < .03$. As shown in Table 5, both high and low ego level girls made almost twice as many choices between cliques as did Conformist/Conscientious girls and the quadratic trend was significant, $F(1,106) = 6.0$, $p < .03$. There was no sex difference in the number of choices made between cliques controlling for total choices made, but there was a significant grade effect, $F(3,204) = 3.0$, $p < .04$. Choices between cliques increased with grade to the junior year, and then decreased for seniors.

Insert Table 5 About Here

Although the number of choices made between cliques was equal for girls at low and high ego levels, high ego level girls were expected to have special roles as liaisons between cliques. In particular, they were expected to make choices across grade and sex categories. Because grade level is a visible and pervasive individual status characteristic in high schools, an important part of the liaison role would be the ability to manage friendships with students in other grades and provide feedback connections between cliques. To test this hypothesis, choices between cliques were cross-tabulated by choosers' ego levels and receivers' grade levels. These choices were then grouped by choosers' grade levels, which was used as a control variable.

Goodman's (1978) log-linear analysis was used to test the partial association between choosers' ego levels and receivers' grade levels, controlling for choosers' grade levels. The analysis is summarized in Table 6. The significant variation in 1, the first order model, shows

that the three variables are not mutually independent and that higher order models must be considered. The second-order model introduces effects due to associations between pairs of variables and has two parts, 1a and 1b. The unexplained variation in the first-order model is partitioned into 1a, the variation unexplained by the complete second-order model and 1b, the variance accounted for by the complete second-order model. Finally, the complete second-order model is partitioned into components 1b.1 and 1b.2. The crucial test is shown in 1b.1, which indicates a significant partial association between chooser's ego level and receiver's grade, controlling for chooser's grade, χ^2 (2) = 7.83, $p < .03$. The significant variance remaining in the second-order model, shown in 1b.2, indicates the existence of other two-variable effects.

Insert Tables 6 and 7 About Here

As shown in Table 7, low ego level girls confined their choices between-cliques to cliques in the same grade. Conformist/Conscientious girls made more choices to cliques in different grades, but of these choices, most of them were directed from freshmen and sophomore girls to junior and senior girls. Finally, high ego level girls made choices to cliques in <u>both</u> directions across grade levels, with equal frequency. Their role was particularly unique in providing a majority of the total choices from junior and senior girls to girls in lower grades.

As mentioned, ego development was unrelated to the number of boys' choices between cliques. Employing the log-linear analysis, ego development was also unrelated to the direction of their choices across grade levels. However, there was a significant sex difference in the proportion

of choices between cliques made across grade levels. Boys made only 11% (8) of their between-clique choices across grade levels while girls made 23% (31) to students in different grades. This difference in proportions was significant, Z (two-tailed) = 2.09, $p < .05$.

The second major selection variable in this school tended to constrain friendship choices to members of the same sex. Choices between cliques from one sex to the other were examined for ego developmental trends, but none were found. There was also no difference in the proportion of choices between cliques made to students of the opposite sex, by boys and girls.

Discussion

An Unanticipated Sex Difference

These results supported the hypothesized relationships between ego development and social network structure, but only for girls. This unanticipated sex difference could be attributable to method variance if the sociometric questionnaire elicited systematically different responses from boys and girls. However, no sex differences were found in four out of five indices of network structure (choices made and received, choices among one's friends and choices between cliques). The only significant sex difference was the greater number of mutual choices made by girls, a result frequently obtained in earlier research (Eder and Hallinan, 1978; Epstein, Note 1; Glidewell, et al., 1966; Gronelund, 1959).

The pattern of association between mean ego development and social structure was so consistent for girls and so random for boys, that a real sex difference in the importance of friendships for personality development is suggested. This hypothesis has not been tested directly,

but there is evidence of sex differences in styles of social interaction that may be associated with personality development. Lever (1975), for example, found that girls tended to interact in small play groups, particularly dyads, while boys formed larger play groups. Eder and Hallinan (1978), studying changes in dyads in fifth and sixth graders, observed that girls' dyads were less fluid and more exclusive over a school year. In the present study, girls had more mutual friendships than boys. Taken together, these results suggest that girls show more involvement and interest in intimate, dyadic friendships than boys.

Gunnarsson's (Note 2) longitudinal study of day-care centers in Sweden provides clues about the social processes responsible for these sex differences. He reported that girls displayed more imitation and role playing than boys when interacting with adults, and were encouraged to have more contacts with adults. Boys spent more time in peer-oriented activities than girls, and more of their interactions with adults consisted of being punished for breaking rules. These and other findings (cf. Maccoby and Jacklin, 1974) suggest that boys get more practice in action-oriented peer games while girls spend more time in one-to-one relationships with parents or adult care-givers. If interaction with adults stimulates more personality development in children than interaction with peers, then intimate, mutual relationships may generally become associated with personality development for girls more than boys. This may also account for the higher ego development of girls in this adolescent sample.

Sex differences in network-level social behavior have not been studied in detail (Hallinan, Note 3). On the basis of available evidence, Deaux (1977) concluded that there is a sex difference in self-presentational

strategies relevant to network structure. Men attempt to assert their status while women prefer more egalitarian relationships characterized by friendliness and mutuality. Maccoby and Jacklin (1974) reported that boys often had larger play groups than girls, but that this difference may be a function of sex-typed play activities. In the present study, there were differences in neither the sizes of boys' and girls' friendship cliques, nor in the numbers of friendship choices made between cliques by each sex. Girls did make a significantly greater proportion of between-clique choices across grade levels than boys. If this represents lower salience of status to girls, it would be consistent with Deaux's (1977) conclusion. Clearly, more research on sex differences in network social behavior needs to be done.

The Association between Ego Development and Network Structure for Girls

In this study, girls' ego development was more strongly associated with their friendship structures than age. The quadratic trends predicted by ego development theory were found for popularity, mutual choices, choices among one's friends, and choices between cliques. In addition, the hypothesis that high ego girls would make most of the choices from upper to lower grade cliques was confirmed. Only the hypothesis that Conformist/Conscientious girls would have the largest cliques was not supported. By contrast, age was not associated with mutuality, popularity or clique size. There was a decrease in choices among one's friends with age and a curvilinear association between age and choices between cliques, but these effects could not have been predicted from a knowledge of age alone. Substantial variation in ego development and friendship structures within age groups weakened age effects. For girls in this sample, ego development provided a more sensitive criterion of development than age.

The intensive case study of a single network necessarily limits the generalizability of the results. Lakeside school is unusual in the high levels of face-to-face interaction, high student autonomy, and the lack of institutional constraints on interpersonal friendships which are found there. Many network settings probably have organizational characteristics which prevent network structures from being closely associated with ego development. Further research is needed to explore network conditions which encourage the expression of ego developmental preferences for specific friendship structures. It also may be true that other personality characteristics may be more salient to an understanding of network structure under different network circumstances. As a first step toward specifying the relationship between personality and network structure, this study has demonstrated that correspondences predicted by ego development theory can be found in a particular network.

The results of this study suggest that girls' preferences for varying friendship structures follow a sequence corresponding to stages of ego development. The progression from low ego levels to the Conformist/ Conscientious stage is accompanied by increased involvement in mutual friendships. The transition to higher ego levels is associated with greater involvement in liaison roles across grade levels and fewer mutual friendships. The cross-sectional design of this study precludes assigning causal priority to either ego development or network roles in interpreting their association. It may be that girls who have attained the Conformist/Conscientious ego stage have the interpersonal skills needed to maintain mutual firendships and are therefore selected into tight, cohesive friendship cliques. Alternatively, the experience of participating in successively more complex network structures may stimulate girls'

ego development. For example, the challenge of managing diverse and perhaps conflicting friendships as a liaison between cliques may cause the transition from the Conformist to the Conscientious or Autonomous ego stages. Clearly, a longitudinal study is needed to trace concomitant sequences of personality development and changing participation in social structures of varying complexity.

The results of this study challenge the widely held but untested assumption that personality growth is always associated with increasing mutuality in interpersonal relationships. There is an implicit bias toward investigating lower-order dyadic and triadic structures in much network research (Granovetter, Note 4), which has ruled out the possibility of discovering developmental trends in larger network structures. In the present study, increasing mutuality was associated with girls' ego development through intermediate ego levels, but mutuality decreased at the highest ego levels. High ego level girls certainly did not lose their capacity for mutual friendships. Instead, they became involved in higher order, more complex network structures. Their roles as liaisons between cliques required them to sustain unbalanced, weak dyadic friendships. What appears to be an inexplicable increase in unbalanced dyads at higher ego levels may in fact facilitate girls' psychological integration of their liaison roles between large clique structures. Highly developed individuals are probably more aware of the existence of higher-order network structures and the consequences of their behavior in them (Selman and Jaquette, 1977).

Previous research has failed to find linear personality correlates of interpersonal balance at the dyadic level (Abelson, 1968; Newcomb, 1978). The results of this study suggest that a reconceptualization of dyadic

balance as part of a larger system of network processes may uncover regular but more complex relationships between personality variables and social structure. Future research should at least include measures of network structure at a variety of levels, because higher-order structures are not simple aggregations of dyads and triads. They may have unique properties which help explain behavior in lower-order structures (Granovetter, Note 4).

Another issue concerns the attributional processes underlying interpersonal relations. Newcomb (1978) has observed that balance theorists have concentrated their attention on intrapersonal, psychological attitudes and cognitions. Rarely has the correspondence between psychological balance and actual balance in interpersonal relationships been examined. The work of Guttentag and Longfellow (1977) suggests that there are developmental differences in attributional processes which may extend to social network structures. In this study the peak of girls' involvement in tight, cohesive cliques at the Conformist/Conscientious stage, for example, may indicate that these girls rely on each other for information and interpretations of their experience. Their self-attributions and internal psychological states may depend more on cues provided by others in interpersonal interaction than is true of girls at higher or lower ego levels. If this were the case, convergence between intrapersonal and interpersonal sentiments would be a natural result. In contrast, high ego level girls may transform information in an interpersonal situation to serve their own needs, while low ego level girls may simply use denial and selective inattention to block out discordant information. Eventually, knowledge of the ego development

composition of a group may help explain group cohesion and social psychological processes underlying peer-selection and influence.

A final question raised by these results concerns the degree of psychological stress caused by unbalanced friendships. Based on Heider's (1958) theory, psychological imbalance has been assumed to be uniformly stressful for everyone. A reasonable speculation is that there are developmental differences in the tolerance of psychological imbalance. According to Loevinger (1976), high ego level individuals should tolerate psychological uncertainty better than their lower ego level counterparts. An additional possibility is that there may be developmental differences in the interpersonal sources of stress as well as in the tolerance of given intensities of stress. An unbalanced dyad causing psychological stress in a Conformist/Conscientious person may not be experienced as stressful by a high ego level individual. Conversely, the management of tricky liaison roles that are beyond the perception of lower ego level individuals may stress the Conscientious or Autonomous person. What is needed is research on the psychological consequences of various network structures for individuals at different stages of ego development.

It would be premature on the basis of these results to conclude that the internalized models of the world represented by ego development stages reflect the objective social structure in which girls are situated. Not only is a longitudinal replication of these results required, but there are also problems in the conceptualization and measurement of personality structures (Feldman and Toulmin, 1975) and social network structures (Burt, 1978). The use of structural concepts, however, has demonstrated correspondences between personality and social structure in

independent but commensurate terms. Further research will probably show that these correspondences are not perfect but are forms of "developmental parallelisms" (Selman and Jaquette, 1977) in which similar sequences of development in different domains are identified. In this study, there was a parallel between girls' ego development and the complexity of their roles in the social network. The correspondence was not perfect--not all high ego level girls were liaisons between cliques, for example, and some liaisons had low ego levels. Further research is needed to identify circumstances which enhance or limit the correspondence between personality and network structure, and discover how the correspondence develops through interpersonal behavior.

Educational Implications

If future research shows that interpersonal competence and personality growth is caused by experience in progressively more complex social structures, then it should be possible to organize schools to stimulate such development. School grouping practices offer students some opportunities for interaction and prevent others, particularly at the high school level. Each social setting probably encourages specific patterns of student social interaction and peer group structures. For example, settings that create homogeneous groups of students, such as high-ability classes, probably encourage mutual friendships based on "strong ties" (Granovetter, 1973) and cohesive, relatively well-defined cliques. These groups would be most congenial to students at the Conformist and Conformist/Conscientious ego levels. School settings that produced heterogeneous groups such as sports teams would allow students to associate with dissimilar peers, and would offer opportunities for liaison roles between dissimilar

peer groups. The evidence of the present study suggests that liaison roles require more complex interpersonal skills and a higher level of personality development, than mutual friendships in homogeneous peer groups.

It is our speculation that school social settings which "fit" the interpersonal preferences of students at each developmental level would maximize student satisfaction, motivation and achievement. Students at the low ego levels, for example, would probably function best in a learning environment emphasizing teacher control and supervision, clearly stated goals and standards, and structured one-to-one relationships with student models at high levels of development. At middle ranges of ego development, students would be expected to prefer a school setting allowing extensive interpersonal interaction with homogeneous peers. A looser, more open classroom structure utilizing group activities would probably help these students achieve their best. Goals should be set by the teacher, but some task performance and evaluation should be assigned to peer groups. Students at this level of development would be most receptive to learning to function in such groups. At higher levels of development, the teacher should become more of an advisor and consultant to student-initiated independent study projects, than an arbiter of knowledge in traditional classrooms. These students are capable of more autonomy in determining their activities and evaluating their own progress, and also need more opportunities to interact with heterogeneous sets of students to satisfy their diverse interests.

These speculations raise additional research issues. Little is known, for example, about the best pacing of school organizational practices for development, how long students should be exposed to each school

environment and when they are ready to tackle the developmental challenges of moving into more complex settings. Another important and neglected issue is how students' memberships in mutliple peer settings in the high school might affect developmental progress. If sports and extracurricular activities furnish most of the opportunities for weak interpersonal ties compared with classrooms in a school, perhaps they could be utilized in a more systematic way to support complex student networks, and foster interpersonal development.

The crucial conclusion that comes from the present research is that student social roles have unintended, previously unrecognized associations with individual personality development, and, most likely, interpersonal competence. Because school organization typically provides students with a variety of opportunities for social interaction, it is incumbent upon us to discover how within-school schedules can be adjusted to maximize student development. Whatever the results of future studies about the relative benefits of various peer structures, these studies will help us understand more fully how the complexities of the roles of students in schools influence individual achievement and interpersonal outcomes.

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Table 1

Mean Ego Development by Grade and Sex

	Sex	
Grade	Boys	Girls
Freshmen	4.29 (28)	5.52 (29)
Sophomores	5.08 (24)	5.61 (33)
Juniors	5.38 (26)	5.90 (29)
Seniors	5.29 (21)	5.44 (25)

Note. Numbers in parentheses in this and all following tables are cell n's.

Table 2

Mean Popularity by Ego Development and Sex, Controlling for Grade

Ego Level	Sex	
	Boys	Girls
Impulsive-Conformist	3.33 (25)	2.94 (13)
Conformist/Conscientious	3.14 (40)	4.61 (36)
Conscientious-Autonomous	3.27 (34)	3.17 (67)

Note. Means adjusted for grade level.

Table 3

Mean Mutual Choices in Dyads by Ego Development and Sex, Controlling for Grade and Choices Made

	Sex	
Ego Level	Boys	Girls
Impulsive-Conformist	1.90 (24)	1.91 (13)
Conformist/Conscientious	1.73 (38)	2.71 (35)
Conscientious-Autonomous	1.32 (32)	2.25 (65)

Note. Means adjusted for grade and choices made.

Table 4

Mean Choices among One's Friends in Triads
by Ego Development and Sex, Controlling for Grade

	Sex	
Ego Level	Boys	Girls
Impulsive-Conformist	2.06 (19)	1.93 (10)
Conformist/Conscientious	2.09 (30)	2.82 (25)
Conscientious-Autonomous	1.58 (21)	1.67 (50)

Note. Means adjusted for grade.

Table 5

Mean Choices Made between Cliques

by Ego Development and Sex, Controlling for Grade and Choices Made

	Sex	
Ego Level	Boys	Girls
Impulsive-Conformist	1.01 (22)	1.49 (13)
Conformist/Conscientious	.89 (34)	.88 (35)
Conscientious-Autonomous	1.15 (29)	1.49 (63)

Note. Means adjusted for grade and choices made.

Table 6

Analysis of Association in Table 7

Source of Variation	χ^2	df.	p
1. Total mutual dependence among variables R, C, E	55.52	7	.001
1a. Due to mutual dependence unexplained by model RC, CE, RE	8.16	2	.017
1b. Due to mutual dependence explained by model RC, CE, RE	47.36	5	.001
Partition of 1b			
1b.1 Due to mutual dependence explained by RE in model RC, CE, RE	7.83	2	.025
1b.2 Due to mutual dependence explained by model RC, CE	39.53	3	.001

Note. R represents receiver's grade, C chooser's grade and E chooser's ego level.

Table 7

Distribution of Girls' Choices between Cliques by Grade and Ego Development

	Receiver's Grade	
Chooser's Grade	Lower	Upper
Low Ego Levels		
Lower	9	1
Upper	0	6
Medium Ego Levels		
Lower	1	7
Upper	3	24
High Ego Levels		
Lower	21	10
Upper	10	41

Note. Lower grades include 9 and 10, upper grades include 11 and 12. Low ego levels include Impulsive through Conformist, medium includes Conformist/Conscientious, and high includes Conscientious through Autonomous.